# AbstractID: 4457 Title: A Medical Physicist's Guide to The International Electrotechnical Commission (IEC)

The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes international standards for all electrical, electronic and related technologies. These serve as a basis for national standardization and as references when drafting international tenders and contracts.

Through its members, the National Committees of participating countries, the IEC promotes international cooperation on all questions of electrotechnical standardization. The IEC embraces all electrotechnologies including radiology and radiation oncology, as well as associated general disciplines such as terminology and symbols, electromagnetic compatibility, measurement and performance, dependability, design and development, safety and the environment.

IEC standards are developed by its technical committees, of which TC 62 addresses electrical equipment in medical practice. Within TC 62, Subcommittee 62C deals with equipment for radiation therapy, nuclear medicine and dosimetry. And within the subcommittee, Working Groups are responsible for writing IEC standards and technical reports. These standards dictate how electrical equipment shall be built, primarily from the standpoint of safety, although some technical reports address performance issues. For example, recent standards, or amendments to existing standards, have defined the coordinate systems to be used by radiotherapy equipment (forcing all manufacturers to change in one way or another to comply); specified the allowable leakage through multileaf collimators; and strengthened requirements for treatment planning systems. At this writing, WG-1 is revising the performance standard for linear accelerators.

Membership on a Working Group is through a National Committee. The US National Committee is responsible for coordinating distribution of IEC drafts for review, collecting and submitting comments and votes, and recommending participation at meetings. IEC standards are too complex and carry too much significance for one person to manage, so the US has established a technical advisory group (TAG) to support the US representatives to the working groups. The role of the US TAG is to contribute to the preparation of these documents and ultimately advise the USNC how to vote on the final approval of the documents.

The US TAG consists of nine members supported by AAPM, ASTRO and ACR, but includes another 8 members representing industry and the regulators. TAG meetings are generally scheduled shortly before meetings of WG-1, to prepare the US position on documents to be discussed. On occasion, conference calls are used, but generally TAG meetings are face-to-face, to facilitate discussion.

To summarize: This is a valuable activity that is critical to assure that radiation therapy equipment design properly balances the safety of patients, staff and the public; the desires for new capabilities; and practical and efficient use. Maintaining a medical physics presence on IEC committees and working groups is essential to ensure that economic issues and regulatory pressures do not dictate equipment design.

Educational Objectives:

1. Become familiar with the structure of the IEC and the working groups that develop standards.
2. Appreciate the significance of IEC standards and their influence on the design of radiation oncology equipment.
3. Learn about several specific IEC standards and how they have affected the design of equipment in use today.